

## The bulk density variation of Singo pumice at Towada volcano

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The systematic change of pyroclasts from scoria (Ninokura stage) to pumice (Nakanoumi stage) is observed in post caldera stage of Towada volcano, northeast Japan. We characterized for pyroclasts in post caldera stage of Towada volcano for the recent 13,000 years and especially for the episode G, named as Singo the transition stage from the scoria eruption to the pumice eruption.

The difference of yellow pumice and grayish pumice is results from different degree of vesiculation because they have same identical chemistry.

The typical stratigraphy of unit G is at the outcrop near the upper stream of Amaike river. This eruptive unit is represented by a single member, the Shingo pumice;

- 75 cm reddish yellow pumice (well-vesiculated) (G1:upper, G2:lower),
- 18 cm grayish yellow pumice (fine and poorly-vesiculated) (G3),
- 40 cm reddish yellow pumice and grayish yellow pumice (G4:upper, G5:lower),
- 35 cm reddish yellow pumice, finer at base (G6).

The bulk density distribution of pumice in unit G is divided into three groups; 0.2-0.7, 0.8-1.2 g/cm<sup>3</sup> and more than 1.2 g/cm<sup>3</sup>. Pyroclasts of unit G was divided into gray pumice, yellow pumice and banded pumice. The lighter pumice is reddish-yellow and large in diameter, and the heavier pumice is grayish and small. Just unit G4 and G5 has banded pumices. Banded pumice has more than 1.2 g/cm<sup>3</sup> in bulk density.

Unit of G exhibits remarkable variation in the density and the size distribution with the stratigraphic position of pyroclasts. At G3 composed of mainly gray pumice the median diameter is minimum. This minimum corresponds to the maximum value in the averaged density.

Most plagioclase of G are composed of anorthite rich (~ 80 %) dusty/dissolution core and anorthite poor (~ 62 %) rim with oscillatory zoning.

There is no difference in anorthite content in plagioclase between the gray pumice and the yellow pumice. The chemical variation of G independents on sequence. The lithological change of G from gray pumice to yellow pumice don't correspond to the chemical change. Banded pumice has more than 1.2 g/cm<sup>3</sup> in bulk density and elongated bubble structure. Usually the elongated bubble structure was formed under the degassing process. Degassing process makes the lithological change of G.